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ILM peeling in rhegmatogenous retinal detachment; Does it improve the outcome?

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1 Peeling of the internal limiting membrane at the macula has been shown to improve visual
2 outcomes in a number of diseases most notably large macular holes. Perhaps partly related
3 to it being a surgically satisfying manoeuvre, its use has been extended to a wide variety of
4 vitreoretinal indications including more recently and controversially primary
5 rhegmatogenous detachment. Previous studies have suggested that its use reduces
6 postoperative ERM formation and may improve visual results, although these have largely
7 been retrospective or small comparative but non randomised studies [1-5]. In this issue
8 however Eissa et al. report a randomised controlled study of ILM peeling in 43 eyes
9 undergoing vitrectomy for macula involving retinal detachment and report a detrimental
10 effect of ILM peeling [6]. Although there was a lower incidence of ERM in the ILM peel
11 group, visual acuity and macular sensitivity were significantly better in the no peel group.
12 The studies generalisability can be criticised in that silicone oil was used in all eyes despite
13 all cases having less than C PVR based on lack of access to long acting gases. There was also
14 a significantly longer duration of macula detachment in the peel group, and a significantly
15 greater extent of retinal detachment in the non peel group, however neither of these
16 differences were significant to final visual outcome on multivariate analysis.

22 Being the only randomised study to date on this subject the findings of Eissa et al deserve to
23 be taken seriously. There are a number of possible explanations for the apparent
24 detrimental effect of ILM peeling in this series.

27 ILM peeling is known to have a number of potentially adverse effects on retinal structural
28 and function no matter how carefully performed, related to that fact that when the ILM is
29 peeled from the retinal surface fragments of the underlying Muller cell end feet are avulsed
30 with it [7]. Interestingly the extent to which this occurs varies by disease, and a deeper
31 plane of separation may have greater effects on retinal function. ILM examined from
32 patients undergoing idiopathic ERM peeling have shown more Muller cell fragments,
33 suggestive of a deeper plane of separation, than in those from macular hole specimens
34 without ERM [8]. It is well known that in retinal detachment, Muller cell activation and
35 elongation of their processes occurs not only towards the outer retina but also to, and
36 through the internal limiting membrane onto the retinal surface with ERM formation [9].
37 Forced avulsion of the ILM by peeling from the retinal surface in this situation would thus
38 likely have a more profound effect on retinal structure and function than in a non-activated
39 state. The extent of Muller cell activation is at least in part related to RRD duration and it is
40 significant that Eissa et al observed a very marked dimpling of the retinal surface
41 representing a severe 'dissociated optic nerve fibre layer appearance' (DONFL) in the ILM
42 peeled group. Relevantly DONFL severity has been related to the amount of Muller cell
43 material avulsed during ILM peeling, and possibly to visual outcome in macular hole surgery
44 [10]. It is also possible that ILM peeling in a detached retina is more traumatic per se than in
45 attached retina related to surgical difficulty and variable angle of peel in a mobile retina [5].
46 Eissa et al used BBG with a contact time of 30 seconds to stain the ILM and peeled without
47 the use of heavy liquids to stabilise the retina as other authors have described [11].

57 Silicone oil was used in all cases in the RCT and oil related visual loss may have played a role
58 in the outcomes. Although the pathogenesis of this enigmatic condition is unclear it has

1 been consistently linked to changes in the inner retina [12-14]. ILM peeling would clearly
2 increase oil/nerve fibre layer contact and the potential for a toxic effect The incidence of oil
3 related visual loss has also been recently linked with raised intraocular pressure although
4 pressure changes were not reported in the study [15].
5

6 The main benefit proposed for ILM peeling in RRD surgery has been a reduction of
7 postoperative ERM with several studies reporting large differences [1-4], with high
8 prevalence in the non peeling groups. The incidence of ERM reported after retinal
9 detachment varies widely depending on the definition used and case mix of the RRDs but
10 ERM thought to have a significant visual effect has typically been reported in ~4-8% of cases
11 of uncomplicated RRD (i.e. without pre-existing PVR) treated with vitrectomy surgery
12 [16,17]. Eissa et al observed that although there was a difference in the prevalence of ERM
13 on postoperative OCTs in their study, none of the ERMs seen in the no peel group were
14 clinically significant and non-required further surgery. The clear question that arises is
15 whether the potential morbidity of ILM peeling is warranted in uncomplicated RRD when
16 the incidence of significant ERM is so low. Indeed, ERM can be peeled post RRD repair if
17 required with good results (even without ILM peeling) [18].
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23 ILM peeling in RRD can only be justified if it improves results. This RCT, albeit small and
24 single surgeon suggests that it doesn't in macula involving RRD without PVR tamponaded
25 with silicone oil. Indeed, it had a deleterious effect on outcome. It may be it has a role in
26 subsets of patients e.g. those with PVR and those with macular on or just off cases. Further
27 well designed RCTs in macula attached and detached cases will be needed to answer this
28 controversy definitively, but in the meantime we would suggest that it should not be
29 regarded as standard practice.
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